

WHAT IS CLAIMED IS:

1. An image display apparatus comprising:

image display means including a pixel in a region near an intersection at which each of signal lines and each of scanning lines are intersected each other, said signal lines and said scanning lines being arranged in a matrix shape, and said pixel being connected to said signal line and said scanning line via an switch element;

a group of gradation voltage lines applied analogue gradation voltages in accordance with display gradations;

decoder means for producing switch drive signals by which any one of said gradation voltage lines is selected in accordance with digital high-gradation image data;

trigger signal output means for sequentially producing trigger signals in accordance with said image data; and

a plurality of switch means for selecting a specified gradation voltage line in response to said switch drive signals under condition in which said trigger signals are inputted, to supply a gradation voltage from said specified gradation voltage line to a specified signal line.

2. An image display apparatus according to claim 1, wherein said decoder means is divided into a plurality of decoders which are arranged to oppose each

other.

3. An image display apparatus according to claim 1, wherein

a plurality of switch drive lines for transmitting said switch drive signals are connected to said decoder means;

a plurality of trigger lines for transmitting said trigger signals are connected to said trigger signal output means; and

output lines for transmitting said specified gradation voltage to said specified signal line are connected to said plurality of switch means.

4. An image display apparatus according to claim 3, wherein said plurality of switch drive lines and said group of gradation voltage lines are arranged to intersect said plurality of trigger lines and said output lines.

5. An image display apparatus according to claim 4, wherein said group of gradation voltage lines are arranged in parallel along said plurality of switch drive lines.

6. An image display apparatus according to claim 4, wherein one of said switch drive lines is arranged in parallel with one gradation voltage line of said group of gradation voltage lines.

7. An image display apparatus according to claim 4, wherein two switch drive lines of said switch drive lines are arranged in parallel on both sides of one

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gradation voltage line of said group of gradation voltage lines.

8. An image display apparatus according to claim 3, wherein said group of gradation voltage lines and said plurality of switch drive lines are formed as a same wiring layer.

9. An image display apparatus according to claim 3, wherein said plurality of trigger lines and said output lines are formed as a same wiring layer.

10. An image display apparatus according to claim 3, wherein distribution means for distributing output voltages from said output lines to said plurality of signal lines is provided between said output lines and said plurality of signal lines.

11. An image display apparatus according to claim 8, wherein said group of gradation voltage lines and said plurality of switch drive lines are made of a wiring material of aluminum or copper.

12. An image display apparatus according to claim 1, wherein when  $n$  is a display gradation number, a wiring number of said group of gradation voltage lines is in a range from  $n$  to  $2n$ .

13. An image display apparatus according to claim 1, wherein said image display means, said group of gradation voltage lines, said plurality of switch means and said trigger signal output means are formed on a same substrate.

14. An image display apparatus according to claim

13, wherein said decoder means is disposed on a surface of said substrate or on a periphery of said substrate.

15. An image display apparatus according to claim 1, wherein said image display means, said group of gradation voltage lines, said plurality of switch means, said decoder means and said trigger signal output means are formed on a same substrate.

16. An image display apparatus according to claim 1, wherein said trigger signal output means is formed using a shift register circuit.

17. An image display apparatus according to claim 1, wherein

each of said plurality of switch means includes:

a first thin film transistor which becomes conductive by being inputted said trigger signal to transmit said switch drive signal; and

a second thin film transistor which becomes conductive by said switch drive signal produced from said first thin film transistor to transmit a gradation voltage to said output line.

18. An image display apparatus according to claim 17, wherein each of said plurality of switch means includes a condenser for holding said switch drive signal produced from said first thin film transistor.

19. An image display apparatus according to claim 18, wherein said condenser is an electrostatic capacity formed by overlapping any one gradation voltage line of

said group of gradation voltage lines and an electrode formed in a wiring layer different from said group of gradation voltage lines.

20. An image display apparatus according to claim 17, wherein each of said plurality of switch means includes memory means for storing said switch drive signal produced from said first thin film transistor as at least one-bit information.

21. An image display apparatus according to claim 17, wherein said plurality of switch means are disposed in regions near intersections at which said switch drive lines and said trigger lines are intersected each other, respectively.

22. An image display apparatus according to claim 17, wherein said first thin film transistor and said second thin film transistor are formed using n-channel thin film transistors when the gradation voltage on said gradation voltage line is relatively smaller than a signal voltage on said switch drive line, and are formed using p-channel thin film transistors when the gradation voltage on said gradation voltage line is relatively higher than the signal voltage on said switch drive line.

23. An image display apparatus according to claim 17, wherein each of said plurality of switch means includes voltage level conversion means for amplifying said switch drive signal.

24. An image display apparatus according to claim

23, wherein wiring lines for supplying a particular voltage and a common signal to said voltage level conversion means are arranged in parallel in said group of gradation voltage lines.

25. An image display apparatus according to claim 1, further comprising voltage generation means for applying different voltages to said group of gradation voltage lines.

26. An image display apparatus according to claim 25, wherein said voltage generation means includes a plurality of ladder resistors connected in series with a voltage source.

27. An image display apparatus according to claim 25, wherein said voltage generation means is formed on a same substrate as said image display means, said group of gradation voltage lines, said plurality of switch means and said trigger signal output means.

28. An image display apparatus according to claim 1, wherein

each of said pixel includes a liquid crystal interposed between a pair of substrates including a transparent insulating substrate; and

a light transmission factor of said liquid crystal is changed in accordance with a voltage fed from said switch element connected to said pixel.

29. An image display apparatus according to claim 1, wherein

each of said pixels includes a light emitting

film formed on an insulating substrate; and  
a light emission intensity of said light  
emitting film is changed in accordance with a voltage  
from said switch element connected to said pixel.

30. An image display apparatus according to claim 1, further comprising scanning means for sequentially supplying scanning pulses to said plurality of scanning lines.

31. A method of driving an image display apparatus according to claim 1, wherein when said image display apparatus is driven, a drive frequency at which said switch drive signals are supplied from said decoder means to said plurality of switch drive lines is set to twice or more as high as a drive frequency at which said trigger signals are supplied from said trigger signal output means.

32. A method according to claim 31, wherein a number of simultaneous data switching for a gradation data inputted to said decoder means is two or less; and

    said decoder means sequentially produces switch drive signals for selecting one single switch drive line in accordance with said gradation data.

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